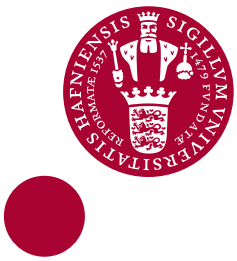

Economic profitability of precision farming, auto guidance and controlled traffic farming systems

site specific informaition management in cereal cultivation

Tavella, Elena; Scavenius, Inger Marie Kirketerp; Pedersen, Søren Marcus

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Economic profitability of Precision Farming, Auto Guidance and Controlled Traffic Farming systems

Site specific information management in cereal cultivation

E. Tavella, I. M. K. Scavenius and S. M. Pedersen

This study analyse the economic profitability of selected Precision Farming technologies and Controlled Traffic systems at farm scale. The selected PF technologies are site specific management of weed, lime and nitrogen as well as auto guidance.

In order to find the economic profit two steps are applied for each technology: First, the economic benefits are analyzed by calculating the expected yield potential or cost saving from implementing each PFtechnology compared with conventional practices. The calculations are based on production data of winter wheat cultivation from the Lower-Austrian region in the case of site specific weed, lime and nitrogen management as well as Controlled Traffic Farming. In the case of auto guidance the data are based on Danish conditions. Second, the costs of implementing new precision farming technology are based on the annual machinery cost for a 500 hectare model farm. Benefits rely on literature review for the various technologies and recent farm trials with PF technologies in Europe and other regions.

Findings from this study indicate that it should be possible to save inputs by using advanced PF technologies (e.g. herbicide, lime, nitrogen, seed, energy and working hours). In addition it may be possible to increase yield rates for site-specific lime and nitrogen management. For CTF systems it seems possible to reduce overlaps with Auto Guidance. However, the availability of practical feasible technologies shows differences: for site-specific weed management there is still a need for autonomous weed detection systems with real time sensors and for variable rate N-application there is still a lack of reliable decision support. On the other hand Auto Guidance and CTF systems seems to be well proven technologies in practice and economic viable with relative large farm sizes. For many of these systems there are significant costs related compared with conventional systems which imply that only some of them are economic attractive.

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